

In the presence of such contradictory opinions, all of which, without exception, have very slight foundation in fact, it certainly seems best at present to keep silence. According to most authors the "endoderm" and "ectoderm," whatever may be their distribution in the body, furnish only the epithelia. All the rest—genital products, skeletal system, in general the body proper—is formed from "mesoderm." Every spongologist will doubtless, then, be somewhat startled to learn from Kleinenberg * that there is generally no mesoderm present.

We may shortly sum up our results in the following sentences:—

1. The Sponges must not be classed amongst the Cœlenterata. They form a type of their own.

2. The Sponges are probably descended from free-swimming forms, which, originally without supporting structures, ultimately developed a strong skeleton.

3. These primitive forms lived at great depths.

4. Coincidentally with life at less depths degeneration of the (siliceous) skeleton took place.

XXXII.—*A Reply to Dr. G. J. Hinde's Communication "On the Genus Hindia, Dunc., and the Name of its Typical Species."* By Prof. P. MARTIN DUNCAN.

AFTER a careful study of Dr. Hinde's paper (Ann. & Mag. Nat. Hist. Jan. 1887, p. 67) I find that it adds very little to our previous knowledge of the interesting Silurian sponge. It is important that the geographical range of the form should have been increased, and it is exceedingly satisfactory that Dr. Hinde should have been able to find some siliceous spicules the shape of which corroborates the statement made by me that the form resembled a tetraclade lithistid. The bulk of the paper consists of criticisms, partly self-contradictory, however, and unsatisfactory in their tone, and partly useful in re-exposing possible errors which had already been discovered by Dr. Rauff.

Dr. Hinde endeavours to explain the strong contradiction regarding the value of Roemer's specific diagnosis by asserting that the casts described by that author are recognizable as the casts of the species *H. fibrosa* = *H. sphaeroidalis*, nob.

* Zeitschr. für wiss. Zool. Bd. xliv.

But that is merely shifting the argument away from the proper and only path. Røemer regarded the casts, which he described very well, as those of a Favositoid coral, and Dr. Hinde states in a footnote that "Ferd. Røemer does not stand alone in making this mistake." There is no possibility of a zoologist classifying a lithistid sponge with Røemer's species by following his descriptions. Dr. Hinde, knowing that the fossils erroneously described by Røemer are casts of a lithistid sponge, has added to our knowledge; but Røemer was not aware of the fact, and did not state it. I do not see that Dr. Hinde has improved his position, and in fact he shows that Røemer had not seen the form in any other state of preservation than that of a cast; and we have yet to learn, as palaeontologists, that the correct delineation and slight description of a cast is to be accepted as a correct and useful specific diagnosis of the perfect form.

Fossil sponges are described according to their shape, the shape and arrangement of their spicules, and the nature of their outer (if there are any) and inner spicular elements; but Røemer, whilst he noted the shape of the species, wrote nothing about spicules or their arrangement; he knew nothing about them, and did not describe the species "*fibrosa*" as the cast of a sponge. He considered the form to belong to a species already described by Goldfuss.

The following is his description (Die Silur. Fauna d. westl. Tennessee, p. 20, pl. ii. figs. 2, 2 a, b):—

"*Calamopora fibrosa*, Goldfuss, Petref. Germ. i. p. 82, t. xxviii. figs. 3 et 4, p. 215, t. lxiv. fig. 9.

"*Favosites fibrosa*, Lonsdale.

"Zollgrosse, kugelige Massen, welche auf der ganzen Oberfläche, mit sehr kleinen unregelmässig polygonalen unmittelbar an einander stossenden Zellen-Mündungen bedeckt sind und im innern aus sehr regelmässig von dem Mittelpunkte nach Aussen grade und straff austrahlenden und nach Aussen sich verdickenden prismatischen haarförmig dünnen Röhrenzellen bestehen. Es ist mir nicht zweifellos ob die Stücke wirklich der Goldfuss'schen Art angehören."

The genus *Hindia* and its species were thus described by me (Ann. & Mag. Nat. Hist. July 1879, p. 91):—

"Genus HINDIA.

"The body is free, without an involution of the texture, and consists of a small central space occupied by spicules

which soon form a series of bifurcating, long, straight, radiating canals, which open at the surface. The spicule element is calcareous, more or less in the shape of a stemmed tripod, with four limbs, and swollen or fringed at the ends, where junction takes place in the others.

“The skeleton is remarkable for its regularity.

“*Hindia sphaeroidalis*, mihi.

“The sponge-body is spheroidal. On the surface are papilliform eminences corresponding with the ends of canal-spicules. Centrally the spicules are unattached, are tripod-stemmed in shape, with swollen extremities, and have papillose limbs. Canal-system occupying much space; canals straight, narrow, radiating, opening into their neighbours, and formed by combinations of tetraclade spicules resembling those of the central part, and very regular in shape and size.”

It does not require much knowledge to become aware that the last description enables any one to recognize the species, and that the diagnosis by Røemer is insufficient, incorrect, and misleading.

If Røemer's description is correct enough to carry the specific name he gave, why did not Dr. Hinde give the readers of his *Cat. Fos. Sponges Brit. Mus.* 1883, p. 57, the opportunity of having it before them? The description there given of the species cannot be made to tally with Røemer's, and it is not that which I wrote. It is a new one by Dr. Hinde; and I am free to confess it is not an improvement, especially as it introduces the erroneous statement that from four to six short arms radiate in different directions. Six arms are not found.

Dr. Hinde in his paper offers new evidence against the adoption of the specific name which I gave to *Hindia*. He says “Prof. Duncan does not seem to be aware that even if he substantiated his claim to the name he proposed as against that of Røemer, there is yet another bar to its adoption, since the same species in the interval between Røemer's and Duncan's work was described by Prof. Hall, of Albany, under the title of *Astylospongia inornata*.”

Then follows the extraordinary admission, “The description in this case is indeed very meagre, and, as no figures are given, it might *fairly be alleged** that it is insufficient for the recognition of the species”! The critic proceeds, “That, however, the *A. inornata*, Hall, is the same as *Hindia fibrosa*, Røemer, I am *fairly confident**, as I have myself collected

* Italics mine.

from the same strata, in the localities mentioned by Hall, the fossils answering to his description, and they are identical with Roemer's forms."

I was certainly in ignorance of this "bar," and I now know that it is a frivolous impediment. In fact, if I had suggested this weak piece of reasoning, Dr. Hinde would have been justified in considering that I had not been paying compliments to his intelligence as a zoologist. *Hindia sphaeroidalis*, mihi, is the correct name of the fossil.

The concluding part of Dr. Hinde's next paragraph places me in a difficulty. He considers that I have made errors of observation, "which, to spare Prof. Duncan, it would be preferable to pass over in silence." If that remark is sincere, and really means what it states and infers nothing else, I can only say that, whilst I am obliged to Dr. Hinde for his good will, I decline to let him or anybody else sacrifice the cause of truth to save my feelings. I have never permitted and shall never allow personal considerations to stand in the way of the truth. I venture to state that I have never hesitated to admit an error when I was satisfied that it was one, and to make all the compensation possible. But if there is any other and uncharitable meaning to be applied to Dr. Hinde's words, I must say that they were written in the worst possible taste.

The subjects at issue are the mineral condition of the fossil and the nature of *Palæachlya*. I stated, and it is undeniable, that the spicules are calcareous, and that they are penetrated by an organism which did not, judging from the modern example, live in silica. I hold to that opinion as true, and the slightest examination of the papers I have written on *Palæachlya* and its modern representative, and their comparison with the paper on the nature of the alga which enters and destroys the siliceous spicules of the present day, will suffice to show that there is no contradiction on my part. The silica-perforating organism in no way resembles *Palæachlya*, and there are no proofs of its presence in *Hindia sphaeroidalis*.

It appears that the *Palæachlya* passed in and out of the sponge-spicules and is now seen in the infilling mineral, which I venture to maintain was calcareous originally, and doubtless full of organic matter when it was first introduced. This belief is quite unaffected by the possible grave error of interpretation—not of observation—of which Dr. Hinde accuses me at second-hand, following Dr. Rauff. When I read Dr. Rauff's exceedingly considerate and truly scientific paper I was greatly exercised in my mind about the tremendous mistake I had made in taking silica to be calcite and arragonite.

I must state, however, in extenuation that I etched the surface of my section with hydrochloric acid, and the results led me to believe in the presence of carbonate of lime. Within the last few days I have applied the same acid to the reverse of a polished specimen in the British Museum, and found effervescence not to be confined to the spicular parts. I cannot but believe that I examined an imperfectly silicified portion of the infilling material. That some specimens have a perfectly siliceous infilling I am now well aware. With regard to the replacement of siliceous lithistid spicules by carbonate of lime I have had no doubt for a long time, and the careful reasoning of my friend Prof. Sollas convinced me. Moreover, lately Prof. Hodgkinson has given me the chemical proofs of the possibility of the replacement. Nevertheless, being still satisfied regarding the nature of the perforating organism, I cannot give my adhesion either to Dr. Rauff's or Dr. Hinde's condemnation of the hypothesis of the existence of originally calcareous lithistids, especially when it is quite possible that the siliceous spicules of *Hindia* discovered by Dr. Hinde may be silicifications of originally calcareous spicules. Whenever the evidence to the contrary satisfies me, I shall at once acknowledge my error.

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XXXIII.—*On the Rhopalocera of Northern Borneo.*—Part II.*
By W. L. DISTANT and W. B. PRYER.

Fam. Erycinidæ.

Subfam. NEMEOBIINÆ.

95. *Zemerus albipunctata*.

Zemerus albipunctata, Butler, Cist. Ent. vol. i. p. 236 (1874).

96. *Zemerus emesoides*.

Zemerus emesoides, Felder, Wien. ent. Mon. iv. p. 396. n. 10 (1860).

Settling on grass in forest-paths; not common.

97. *Abisara Savitri*.

Abisara Savitri, Felder, Wien. ent. Mon. iv. p. 397. n. 12 (1860).

98. *Abisara Kausambi*.

Abisara Kausambi, Felder, Wien. ent. Mon. iv. p. 397. n. 11 (1860).

* For Part I. see above, p. 41.